'Are you going to put some statistics in there?' The challenges of a being qualitative researcher in a quantitative world, and how to politely say no!

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Abstract

Some disciplines remain firmly loyal to their historical roots, for example construction management research steadfastly remains a 'science'. Grounded in realist ontology and positivist epistemology, the majority of construction management research is empirical and quantitative. For technical and scientific aspects of construction management this is not an issue, however concern is raised when this theoretical approach is applied to the social aspects of construction, specifically to *people* in construction. People are critical to construction; projects are carried out in social settings and through highly complex social interactions, yet to examine them as if they were a steel beam is highly limiting. It has been argued that alternative approaches, as found in the social sciences, must be employed to further the understanding of those who work and manage people in construction. Yet research forays from such interpretive, qualitative and constructionist perspectives are often met with criticism; that they are 'anti-scientific' and, even worse, 'bad research'. This paper presents an ethnographical tale; how the author negotiated these choppy waters, how she nearly capsized, and how she was eventually able to navigate safely home. This lived experience is supported by examination of the wider philosophical debates within the field, which are stripped back to their ontological roots and an enduring love for Sir Isaac Newton. Methodological critique as part of the research journey is also discussed, and arguments developed to help support researchers seeking to set out on a qualitative quest within a hostile and unfriendly quantitative world.

Keywords: construction management, epistemology, methodology, quantitative, qualitative.

Context: Construction Management Research

Construction Management Research (CMR) is arguably multi-disciplinary, and has been described as sitting at the intersection of natural sciences and social sciences (Love *et al* 2002). Voordijk (2009) goes further and suggests CMR is one of the *design sciences*, seeking to develop knowledge for the professionals of the discipline to support the resolution of problems in the field. Within this categorisation he espouses the labels of *technical laws* and *functional rules* to address the more scientific aspects of CMR, reserving *socio-technical understanding* for the study of people.

However, that the foundations of the discipline lie in the natural sciences can be seen by its accepted theoretical rooting in an objective, realist ontology and a positivist epistemology (Dainty 2008). Sir Isaac Newton and his development of clear and simple laws ' … from which every movement and every position of every particle of matter in the universe could in principle be deduced' (Berlin 2002:6) fundamentally changed scientific thought, and this approach still remains

dominant in CMR, through quantitative, empirical research (Harty 2008; Fellows and Liu 2008). For technical and scientific aspects of CMR this is not an issue, since concrete and steel are happy to obey such laws; however there has been concern when this theoretical approach is applied to the social aspects of construction, especially the research of its people (Dainty 2010). That CMR must explore these areas is not in question; the construction industry is very much a people industry, its processes are carried out by people in social settings and through social engagements (Barrett and Sutrisna 2009), it is the methods by which this research is undertaken that has come under criticism. There has been a predisposition to employ the quantitative methods of the natural sciences to seek to understand or explain social phenomena within CMR (Love *et al* 2002). However, a scientific approach cannot not be translated to people; they do not fit the rules, they do not conform, they are subjective and awkward, breaking them down into atoms and measuring them individually ultimately proves pointless (Midgley 2001). Although science can engineer, it cannot engineer people (Berlin 2001:52), yet that does not stop attempts by many, including CMR, to try.

The Battle for Epistemological Diversity

The epistemological constraints of the discipline are seen by some as serious limitations (Dainty 2008), and calls for a diversity of approaches have been made towards a more balanced methodological output. Alternative approaches, from an interpretivist epistemological position, are desired in order to provide insights and enrich the understanding of those who work with people in construction (Dainty 2008; Harty 2008; Sutrisna 2009).

This criticism is not new within the discipline of CMR; whilst concern is still voiced in the contemporary arena, the pages of *Construction Management and Economics* were host to the origins of this methodological debate in the mid-1990s, sparked by Seymour et al (1997). They challenged the positivist dominance within CMR, arguing that a scientific foundation was no longer applicable to a discipline where the main focus of study is people. This was challenged by Runeson (1997), who claimed that an alternative approach would be 'anti-scientific' and that the traditional positivist research methods were the '…best insurance against bad research' in CMR. Seymour et al responded (1998) with the position that '…the study of human activities is fundamentally different from the study of physical phenomena…' and therefore requires alternative approaches. They countered the dismissal by Runeson of any research which seeks opinion as 'subjective' and 'biased' with the need for rigour within the use of such methods, rather than their straightforward rejection as 'bad research'. The authors thanked Runeson for his explicit voicing of the traditional approach, but argued for the validity and adoption of alternative academic disciplines and approaches alongside the scientific.

Seymour, Rooke and their colleagues have arguably been instrumental in catalysing the paradigm shift that has occurred within CMR in terms of methodological approach. Since the debate began, they have continued in provoking and examining the methodological foundations of CMR and most recently Rooke and Kagioglou (2007) sought to provide a tool to evaluate and guide interpretive CMR in the form of the Unique Adequacy (UA) Requirement of methods. Others have also championed this cause; Dainty *et al* (1997; 2008; 2010) has spoken and written widely on this subject, and repeatedly challenged the CMR community to continue to examine its inherent limitations and its ability to provide a rich and nuanced understanding of industry practice based on

such orthodoxy of positivist methods. Despite the debates of the mid-1990s, it is argued that there has been little real methodological change within the discipline (Dainty 2010).

Is Change Afoot?

However Dainty's vision of methodological stagnation has been countered by some, who feel there has been a shift from positivistic 'hard' research into interpretivistic, 'soft' research within CMR (Fellows 2010). Indeed, there have been various explorations by CMR academics towards the social sciences, and its methods have been drawn upon by individuals keen to apply alternative approaches when examining people and the social aspects of construction (Ness 2010). Examples can be seen from such studies as Hill's (1999) early foray into ethnomethodology, examining the shared linguistic meanings of construction managers; Rooke and Clark's (2005) ethnographic work surrounding learning and knowledge of safety on construction sites employing participant observation; Barrett and Sutrisna's (2009) stance of critical realism, employed in a ground theory study of case studies of arts-based construction projects; and Ness's (2010) approach to the common statement 'Respect for People' found within the construction industry through critical discourse analysis.

If one is to believe Fellows (2010) in his statement, provocative by his own admission, that the traditional approach, the positivist and quantitative, has recently been surpassed by a constructivist, qualitative paradigm, employing interpretivist methods, then these studies should arguably prove to be the norm. However, the findings, and opinions, of others would indicate that this is not the case (Navarro 2009; Dainty 2010), and a study by Dainty (2008) of the contents of Volume 24 (2006) of C*onstruction Management & Economics* found that less than half, 29%, of the submissions involved qualitative methods of research.

There is also evidence of superficiality in the employment of alternative methodologies, illustrated through adoption of alternative methods and modes of analysis without the fundamental change in the underlying epistemological position. This is itself illustrated, again by Fellows, in his book *Research Methods for Construction* (Fellows and Liu 2008). Here the shift towards qualitative and interpretivist approaches is noted, although the authors then state that there are '…potential shortcomings and biases in this approach (which) must be acknowledged'. Yet, shortcomings and bias only remain if the ontological and epistemological position has not moved from the objectivist or positivist. Concerns of bias lie within the realist domain; there is no denial of the bias with the relativist, constructionist approach, where it is considered inevitable, accepted and to be accommodated reflexively (Taylor 2001). In fairness, Fellows and Liu do acknowledge that such a relativist position would say there are only truths but no universal truth, and versions of reality but no one reality, but this is not expanded upon within their book, nor suggested as an alternative approach to be encouraged. Possibly this is not something that could be explored due to confines of space, however it would appear that in CMR, research methods are still grounded in the traditional, objective scientific reality.

Within CMR, evidence of a superficial application is easily demonstrable within the body of research. When subjective, social phenomena are examined, such as safety on sites, there has been a continued reliance on the use of questionnaires informed by initial interviews, a process based on the work of Hofstede et al (1990). Whilst an initial interpretive, qualitative foray is made through

interviews, this data is often immediately taken back into the quantitative positivist arena to construct questionnaires to provide the 'main study' data (see for example Choudry and Fang 2008; Smallwood and Deacon 2008; Ankrah et al 2008; Wamuziri 2008, all examples taken from one CMR conference stream on health and safety). This practice continues despite the heavy criticism of questionnaires and their use in social research from the social sciences themselves, due to their inherent limitations (Inglis 2005, Henn et al 2006; Tzortzopoulious 2008).

It would appear that the underlying ontology and epistemology of CMR has ossified to some extent, and interpretive and qualitative approaches have been somewhat superficially adopted. Indeed qualitative research methods beyond the interview/questionnaire construct are rare; in his C*onstruction Management & Economics* study, Dainty (2008) found only 6 of the 31 qualitative studies within the volume examined used any other method or approach. Whilst some methodological approaches have inherent constraints, for example the use of observation as a method is often limited by restricted access to the field (Rooke and Clark 2005; Chan and Kaka 2007), when such methods are employed at the commencement of a study, this is often again leading towards a final questionnaire to provide statistical support to the argument (Serpell and Rodriguez 2002). In the worst instance, the methodology is somewhat obscure, and no explication of the method or process of analysis is given, rather selective responses to questions from a 'qualitative survey' are simply displayed in list format (Fester et al 2010).

Overall, it would appear that the majority of CMR still desires to found knowledge on ordered experiences associated with scientific experimentation (Knight and Turnbull 2008); to seek out statistics and science through questionnaires and other formal, scientific constructs (Biggs et al 2005). There are however stirrings of long called for change and indeed evidence of adoption of alternative approaches that do reach the ontological bedrock of the discipline, although for those seeking to tread this path, it can be a treacherous one.

The Lived Experience, or, you can't generalise that!

The author was well aware of the need to – hang on a minute! You see! It feels so odd to me to write 'I', I quite forgot I was here! Hellooooooooo! Sorry, overexcited, it can all get a bit too much for those of us deeply forbidden to write in the first person!

Anyway, where was I? Ah yes, so how was my adventure? How did I get on? Well, from the arguments and research debating ontology and methodology within CMR it was clear that a strong grounding in the foundations of methodology was going to be vital for my survival, and this all emerged as I travelled quite a convoluted methodological path…

I was working as a construction site manager when I began my PhD study as a part time student, and my research was inspired by asking the question why, despite all the safety management systems I was intimately familiar with, despite all the regulations, despite all the Personal Protective Equipment, despite all the best efforts of everyone I worked alongside, health and safety incidents still occurred on sites. I could see that most of the ways my company was trying to measure safety weren't working; that the safety climate questionnaires were completed with what the management wanted to hear, not a reflection of reality. But I had also found that quantitative approaches were also common in academia when researching methodology for my undergraduate dissertation, which revealed that people were being measured as if they were constant, that they could be predicted,

that they behaved according to rules and logical thought. My reality tended to argue with this construct. I wanted to know why this didn't fit, or rather didn't seem to me to fit? What alternatives for exploration existed? Could they help? Could they provide a different perspective on people and help us understand how to make it safer on sites?

Consequently, I embarked on a methodological mission with a misguided notion (so I quickly found out) that I would research 'safety culture', just like that. Oh no. My mission took me all the way back to Plato and wend my way forwards down the paths of social science. I discovered cognitive theories and became very excited, I wrote a paper applying this thinking to risk taking on sites. It won a prize. But as I kept investigating, I found that maybe this approach couldn't answer all the questions in terms of my experience. It couldn't predict or explain everything that was common in terms of the uncommon found on sites, and when it tried it tied itself in paradoxical knots. I kept going, and found social constructionism which through its approach didn't even try to explain. It enabled acceptance and understanding rather than any 'scientific' explanations. It unquestionably embraced variation, irrationality, and crazy stupid people doing crazy stupid things, without trying to explain them. It let you explore and understand, without the need for assumptions or generalisations. As far as I could establish it hadn't ever been used on construction sites and so could maybe provide a different perspective.

I could also see that it might not provide the answers that people who write training programmes might want to hear. It didn't produce firm explanations which could be located in the crosshairs and eliminated from sites. Rather it offered insight, illumination and understanding. And in the end, it delivered. My PhD was eventually entitled 'Constructing safety on sites: an exploration of the social construction of safety on large UK construction sites' – just think of the problems with the literature searches there! But I felt it was pretty good, and so did other people. I have presented my research to leading industrial experts, directors in health and safety of million pound organisations, where it was warmly welcomed. Industry felt it helped crystallise realities that were currently fuzzy through a quantitative lens, it explored why these realities were not responding well to measurement, and was able to suggest new ways of intervening that might have a positive effect.

The response from Academia (with a capital A) was rather less open-armed. From those already pushing for a paradigm shift in ontology and epistemology it was well received, and I have managed to win a hat-trick of prizes at ARCOM, the most forward thinking conference in the field. However, step out of that cosy world and things become rather different. Here are some quotes from papers I have submitted to different conferences over the years, representative of some of the challenges I faced along the way:

> *'only five case studies are employed, therefore generalisation is impossible'*

When did I ever say you could generalise? In fact the main methodological argument I am making is that you can't *ever* generalise! Did you even *read* my methodology?

> *'the use of discourse analysis is often context related and when sweeping generalisations are drawn it flaws the very essence of the study'*

Better, but still, who made these sweeping generalisations? I only suggested practitioners could seek 'fit'? I am not the applier of generalisations here mate!

> *'five projects of circa £20 million is by no way representative of UK site construction, which has about £100 billion volume of activity'*

OK, so you want me to trog round every single site then? How come you quantitativsts can just do a 'sample' and then generalise. In fact, thinking about it, when did anyone ever trog round their entire population, eh? Tell me that one!

> *'if the results from the study are extended as representing construction (UK or global), it only reflects weak science.'*

gnashes teeth and falls to the floor

So you get the picture?

However, all is not lost when you get stuff like this from the editor:

> *'perhaps, what needs to be addressed … is to convince the audience (both academia and industry) that the findings are valid and not merely based on anecdotal evidence from small samples'*

Ahhhh, that's better!

Reflections from the Finishing Post

It's all Isaac Newton's fault. The dream remains that ' … all evils can be cured by appropriate technological steps' (Berlin 2001:52), a dream which actually was imposed on society in the political thinking of the 1990s which, through the misapplication of scientific game theory, led to the development of a target driven system. Yet this system is slowly failing as education and health falter despite the statistics seeking continuous improvement. As Adam Curtis argues in *The Lonely Robot* (2007), people are not controllable in this way, they cheat, they lie and they game the system.

But the reliance on numbers remains firm in CMR. That the measurement and survey of people will enable management controls to eventually achieve the goal of zero accidents (a whole other paper, see Sherratt *forthcoming*), is still dominant in the discipline. Yet without recourse to the wider management system, the need for speed, the bonuses for quick rather than safe work, and the fact that people like to take risks simply to feel alive, this approach is unlikely to succeed.

For me, becoming a qualitative researcher in a quantitative world was probably the best thing about my whole PhD experience. At first it was scary as hell. Would I ever get a paper in a conference that didn't meet with claims that it was 'bad research'? Would I ever do a presentation without some grumpy old professor smirking throughout, then asking a dismissive question about theory? Would I ever be able to publish in a journal that had the word 'science' in the title (this question has yet to be answered by the way – paper is pending!). But despite the often felt desire, especially in the early days, to quit and return to a lovely interview/ questionnaire formula with an independent variable (IV) and a dependent variable (DV) and some lovely statistical tests, I held firm. Even when my supervisor asked me with one year to go that 'you are going to do a questionnaire in the end, aren't you?' I managed not to hit him!

My reading and growing knowledge around ontology and epistemology cemented my own opinions of what could be known in this world, what truth was, what could be understood about the social environment, and precisely how. The need to be able to justify and argue my position helped me develop a very strong defence, and has made my own knowledge of methodology far greater than had I remained in the CMR positivist rut. I have had to develop methodological positions within my papers that would withstand criticism (if anyone bothered to read them!), and this is not uncommon. Within the journals of CMR there remains a need to mount epic defences to as-yet-unspoken criticism; the reference list for Brown and Phua's (2011) paper, published within *Construction Management and Economics* runs to over three journal pages itself, whilst Ness (2010) boldly states under a heading of 'research validity' that there is '…no claim to absolute truth or to objectivity…', despite previously establishing her position within constructionism and critical discourse analysis.

Although I am now Dr Fred, I still face these comments every time I submit a conference or journal paper. But I also have friends in industry who also understand that numbers ain't all they're measured up to be. I have colleagues who love to explore different approaches to research and positively revel in it. I also have colleagues who love to taunt me about my 'fluffy' research, and hurl complicated statistical equations at me when I least expect it.

Conclusions: Fred's Top Tips

So, my top tips for being a qualitative research in a quantitative world?

1. Read all you can, methodology is philosophy, so go back to its roots and find Plato in his cave and go from there.
2. Find people who disagree with you and argue with them. A lot. Nicely, but a lot.
3. Develop the hide of a rhino – people won't always read your paper all the way through before passing their judgements.
4. For a PhD, make sure your external examiners understand your position – one of mine was a linguist and social scientist by specialism.
5. Bad science 'science' is usually good social 'science' – people are not steel beams, and cannot be measured as such.

So when someone asks you about statistics, say no politely, no need to be rude! Developing an in-depth knowledge and understanding about your own ontological and epistemological position is the best possible way of defending your work.

But it does takes all sorts of positions to make a world, and different perspectives are to be welcomed, to help build a bigger picture. What position you take is entirely up to you; it should very much be each to their own. People do like statistics, they are nice and comforting, they add a cosy authority to things, they are convincing. But they also know that people are contrary, awkward, inconsistent and sometimes down-right daft. Finding a balance between these perspectives is the challenge, especially in a world of academic egos who like to consider their methodological position the best. But make sure you hold fast to academic rigour, whatever versions of validity, reliability and generalisability you employ, they are necessary and to be held up as a beacon. Bad research does exist; poor study articulation, weak aims, incoherent methodological foundations, journalistic reporting and little or no analysis are all key examples. But rigorous and robust qualitative and

quantitative approaches should really be holding hands and skipping off into the sunset together. Awwww!

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